UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,282	04/28/2005	Karsten Contag	P2002,0918	9492

7590 03/06/2006

Thomas M Fisher
Corning Cable Systems
Post Office Box 489
Hickory, NC 28603

EXAMINER	
PEACE, RHONDA S	
ART UNIT	PAPER NUMBER
2874	

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/533,282	CONTAG, KARSTEN	
	Examiner	Art Unit	
	Rhonda S. Peace	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *18-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *18,19,21-27,29 and 31-34* is/are rejected.

7)☒ Claim(s) *20,28 and 30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 18, 19, 21-23, 29, and 31-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Conde et al (US 6453090).

Addressing claim 18, Conde et al discloses a device for thermally treating an optical waveguide, *as is illustrated in Figure 10A and discussed in the sections of column 10 lines 47-67 and column 11 lines 1-49*, comprising:

- Radiation source **50**
- First optical system comprising beamsplitter **52**, lens and mirrors subsystem 58, control means **60** and **62**, and second light source **64**.

The first optical system generates a beam 68 twice the diameter of the waveguide to be treated to propagate transverse to the longitudinal direction of the waveguide **42** (column 7 lines 54-51, hereafter indicated as 7:54-61). Control means **60** and **62** allows for the waveguide **42** to be transversely positioned off of the center axis of the beam **68**, with regard to the longitudinal axis of the waveguide **42**, which is the preferred location as it preserves the fiber's absorption and conductivity (5:50-62).

- A second optical system comprising lens and mirrors subsystem **56** and beamsplitter **52**. This second optical system is positioned behind the waveguide **42**, with respect to the laser **50**, and reflects radiation that has been transmitted past the side of the waveguide **42**, such as the beam portion that passes through beamsplitter **52**, to be directed into the waveguide from a second side.

In addition, the disclosed system of Conde et al also is suitable for performing treatment upon more than one waveguide (4:65-67 and 5:1-4).

With respect to claim 19, as can be viewed in Figure 10A, Conde et al shows the second optical system is configured to image the beam in a plane parallel to the longitudinal axis of a waveguide **42**, as is seen between the two mirrors preceding lens **56** of the lens/mirror subsystem. This imaging is different from that in a plane extending transversely with respect to the longitudinal axis of the optical waveguide, as it extends plane parallel to the longitudinal axis of a waveguide.

With regards to claims 21-23, Figure 10A of Conde et al illustrates the second optical system as previously discussed having an aspherical lens and plane mirror, both collectively indicated as element **56**, where the lens is arranged between the waveguide **42** and the plane mirror. As also can be seen in Figure 10A, the focal length of the lens **56** is essentially equal to the distance from the lens to the waveguide **42**, measured from the lens to the fiber in a direction transverse to the longitudinal direction of the waveguide, as it can be seen that the light exiting the lens converges to a fine point at the location of the waveguide. Being that the aspherical lens is orientated parallel to the longitudinal axis of the waveguide **42,** as is shown in Figure 10A, it therefore has a positive focal length equal to the distance from the lens to the waveguide **42**, measured from the lens to the fiber in a direction transverse to the longitudinal direction of the waveguide, and has a focal length of zero in the plane parallel to the longitudinal axis of the guide **42** (i.e. two different focal lengths).

Pertaining to claims 29 and 31, Conde et al teaches the welding of multiple optical fibers arranged in parallel (4:47-67, 5: 1-4). These fibers may be treated as was previously discussed, such as the placement of the fibers off-axis with regard to the welding beam (5:50-62), as the welding beam acts on the fiber in a direction transverse to the fiber's longitudinal axis (see Fig 10A), and wherein the beam is at least twice the diameter of the item, in this case items, to be welded (7:54-61).

Regarding claims 32, 33, and 34, Conde et al shows the existence of an angle between the first optical axis and the second optical axis, the angle being equal to π radians. In addition, the first optical system as previously described contains a

"diffractively acting optical element" **58**, as this lens bends, or diffracts, light. Moreover, the first optical system has an optical component **58** (lens) for directing the beam onto the waveguide, a drive device **60** and **62** that allows the *relative* placement of the waveguide **42** with respect to the optical element **58**, so that the beam can be shifted in the longitudinal direction (10:47-67, 11:1-49, Fig 10A). This movement is analogous to allowing the control means **60** and **62** to control the movement of lens **58**, as both movements allows and adjusts the *relative* placement of the waveguide **42** with respect to the optical element **58**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conde et al (US 6453090).

Referring to claims 24, 25, and 27, Conde et al discloses the device as described above. However, Conde et al uses a second optical system having a plane mirror and aspherical lens, as discussed above, and does not disclose a second optical system where the following are included:

- A plane mirror and two cylindrical lenses, where the lenses are arranged between the optical waveguide and the mirror, and a first of the lenses does not have any refractive power in the plane parallel to the longitudinal axis of the fiber and a second of the lenses does not have any refractive power in a plane normal to the longitudinal axis of the fiber.
- A plane mirror, a spherical lens, and a cylindrical lens, where the lenses are arranged between the optical waveguide and the mirror, and wherein the spherical lens has the same refractive power in a plane parallel to a longitudinal axis of the fiber and the cylindrical lens does not have any refractive power in a plane normal to the longitudinal axis of the fiber.
- A cylindrical mirror which is concave in a plane normal to the longitudinal axis of the fiber, and a cylindrical lens, where the cylindrical lens is between the fiber and the mirror, and has no refractive power in a plane extending normal to the longitudinal axis of the waveguide, and wherein the mirror is planar in a plane parallel to the longitudinal axis of the fiber.

The refractive and reflective properties of plane and concave mirrors, as well as cylindrical and spherical lenses, are well known in the art. The systems above, as they redirect an optical beam and converge the beam upon a desired location, are

considered analogous to the optical system of Conde et al. In addition, Conde et al discloses that other lens systems may be used in the device (13:24-26). One of ordinary skill in the art would have found it obvious to use any of the above described lens/mirror configurations, as they all allow, as does the optical system on Conde et al, for a light beam to be converged upon a defined and desired location in a reliable manner.

Referring to claim 26, Conde et al discloses the device as described above. The use of a second optical system having a plane mirror and two cylindrical lenses, as described above, would require the first lens (the lens which has refractive power in the plane normal to the fiber) to have a focal length essential equal to the distance between this lens and the optical waveguide in the plane normal to the axis of the fiber in order to efficiently converge light upon the fiber, as is seen with the system of Conde (see Figure 10A). Therefore, it would have been obvious to one of ordinary skill in the art to construct the system so that a first lens, having refractive power in the plane normal to the fiber, has a focal length essential equal to the distance between this lens and the optical waveguide in the plane normal to the axis of the fiber, as this will ensure proper convergence of the light beam upon the optical fiber.

Allowable Subject Matter

Claims 20, 28, and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The applicable prior art does not disclose, nor does it reasonably suggest a device for thermally treating an optical waveguide where a second optical system is configured to image the beam profile in an non-inverted fashion in a plane parallel to the longitudinal axis of the fiber, and also images the beam in an inverted fashion in the plane extending transversely with respect to the longitudinal axis of the waveguide, in each case with an approximate ratio of 1:1 (claim 20). In addition, the applicable prior art does not disclose, nor does it reasonably suggest, a device for thermally treating an optical waveguide where the device includes a second optical system having a cylindrical mirror and a cylindrical lens, and the focal length of the mirror is essentially half the distance between the mirror and the waveguide (claim 28). Moreover, the applicable prior art does not disclose, nor does it reasonably suggest a device for thermally treating an optical waveguide wherein the distance between the waveguides to be treated corresponds to at least a diameter of the waveguide, and wherein the beam profile extends over the outermost waveguides by a length of at least one diameter of one of the waveguides (claim 30).

Response to Arguments

Applicant's arguments, see page 6, filed 2/13/2006, with respect to the 35 U.S.C.112 2nd paragraph rejection of claims 21-28 have been fully considered and are persuasive. The 35 U.S.C.112 2nd paragraph rejection of claims 21-28 has been withdrawn.

Applicant's arguments with respect to claims 24, 25, and 27 have been considered but are moot in view of the new ground(s) of rejection, necessitated by the Applicant's amendment, and detailed above.

Applicant's arguments filed 2/13/2006, with respect to the 35 U.S.C. 102(e) rejection of claim 18, 19, 21, 29, and 31-34 have been fully considered but they are not persuasive.

With regard to claim 18, Applicant has argued that Conde et al does not disclose the material of claim 1, as Conde et al does not disclose the claim 1 limitation that "a beam profile of the beam whose extent in the transverse direction with respect to the longitudinal axis of the optical waveguide corresponds to at least twice a diameter of the optical waveguide." As evidence, the Applicant cites Conde et al column 7 lines 54-61, which describes the device of Conde et al with respect to Figure 4C. This paragraph simply discusses the heating of an optical fiber in order to adhere the fiber to a substrate. As is apparent from the Figure 4C, the radiation beam used to fuse the fiber to the substrate clearly has an extent which is at least twice the diameter of the optical waveguide shown in Figure 4C. The Applicant has provided no further proof to support the position that Conde et al does not disclose the present invention. Therefore, the original rejections of claims 18, 19, 21, 29, and 31-34 under 35 U.S.C. 102(e) has been maintained.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rhonda S. Peace whose telephone number is (571) 272-8580. The examiner can normally be reached on M-F (8-5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272- 2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Rhonda S. Peace
Examiner
Art Unit 2874

MICHELLE CONNELLY-CUSHWA
PRIMARY EXAMINER
3/1/06